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DEFINITION

CIFICATION

1-SHEET

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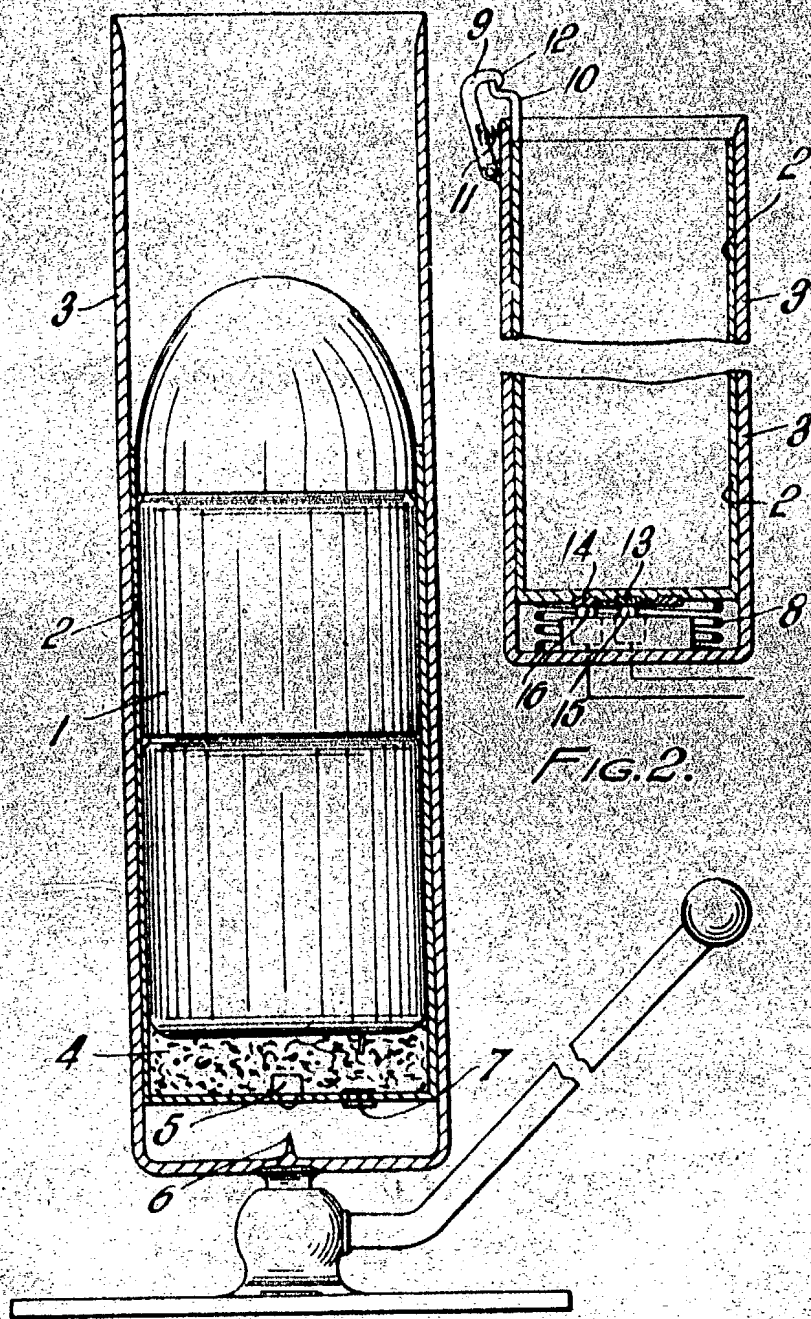


FIG. 1.

FIG. 2.



# PATENT SPECIFICATION

Application Date: July 5, 1937. No. 18627/37.

Complete Specification Left: June 9, 1938.

(Divided out of the Complete Specification of No. 498,595.)

Complete Specification Accepted: Jan. 5, 1939.

EXAMINER'S

COPY  
DIV 22

498,599

## PROVISIONAL SPECIFICATION

### Improvements in or relating to Mortars, Howitzers or the like, and to Cartridges for use therewith

I, LEWIS MOTLEY, a British Subject, of Wren House, 13, North Side, Clapham Common, London, S.W.4, do hereby declare the nature of this invention to be as follows:—

This invention relates to mortars, howitzers or the like, and to cartridges for use therewith.

The object of the invention is the provision of improved means for getting rid of the cartridge case, and the invention consists broadly in the provision of resilient means in the mortar or howitzer whereby said cartridge case is automatically ejected from the muzzle subsequently to each discharge of a projectile.

In accordance with one embodiment of the invention suitable for use in connection with the projection from the ground of anti-aircraft projectiles in accordance with my prior application No. 15977/37 (Serial No. 498,595) the cartridge case, when in place in the mortar, is biased by means of a spring towards the muzzle, and is retained in opposition to such bias by the engagement of a retaining member movably mounted on the mortar with a cooperating retained member fixedly mounted on the cartridge case, said retaining member being biased to the non engaging position and being retained at the engaging position solely by its engagement with the retained member. When the projectile is discharged, the reaction of the discharge moves the cartridge, in opposition to said spring, so that the retained member is disengaged from the retaining member and the latter accordingly springs to its disengaging position; and therefore when the spring re-asserts itself, the retaining member being now out of the path of the retained member, the cartridge case is projected by the spring gently out of the muzzle of the mortar.

The spring may take the form of a simple helical spring located in the bottom of the mortar. The retaining member may be mounted on one end of an L-shaped lever whose other end is pivotally mounted to the outside of the mortar so that said lever may be turned

to and from an engaging position at which the former end extends a small distance over the muzzle for engagement of the retaining member with the retained member. The retained member is mounted at the outer end of the cartridge case near the edge.

The retaining member and the retained member may take the form of respective teeth having re-entrant mutually engaging surfaces such that when said members are engaged the L-shaped lever is retained in opposition to its bias at the engaging position.

The firing of the projecting charge is effected either electrically or by percussion cap. In the former case the inner end of the cartridge case has thereon two contacts connected to the firing circuit which are adapted respectively to engage two contacts in the bottom of the mortar connected to the supply circuit. The contacts on the cartridge case take the form of a central contact and a surrounding ring contact and the contacts in the mortar are respectively central and at the same radius as the ring contact. These latter contacts are yieldable for permitting the casing to move, as aforesaid, in opposition to the biasing spring.

In operation the cartridge case is inserted into the mortar and pressed down in opposition to the spring and the L-shaped lever is turned in opposition to its bias into the engaging position at which it retains said cartridge case. Both arms of the circuit leading to the contacts in the mortar are then independently completed, this requiring two hands and therefore ensuring that both hands are removed from the L-shaped lever. As before described, after the projectile is discharged the casing is gently ejected from the muzzle and all is ready for the immediate insertion of a fresh projectile.

Dated this 5th day of July, 1937.

A. A. THORNTON,

Chartered Patent Agent,

7, Essex Street, Strand, London, W.C.2.

For the Applicant.

[Price 1/-]

## COMPLETE SPECIFICATION

## Improvements in or relating to Mortars, Howitzers or the like, and to Cartridges for use therewith

I, Lewis Motley, a British Subject, of Wren House, 13, North Side, Clapham Common, London, S.W.4, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to mortars, howitzers or the like, and to cartridges for use therewith.

The object of the invention is the provision of improved means for getting rid of the cartridge case and the invention consists broadly in the provision of means whereby said cartridge case is automatically ejected from the muzzle subsequently to each discharge of a projectile.

In order that the invention may be the more clearly understood certain constructions in accordance therewith will now be described, reference being made to the accompanying drawings wherein:

Fig. 1 is a part sectional elevation of a mortar with a cartridge in situ therein. Fig. 2 is a similar view of a somewhat different construction.

Referring first to Fig. 1 the construction illustrated therein is similar to that described with reference to Figs. 1 to 5 of my co-pending specification No. 15977/37 (Serial No. 498,595). The projectile as a whole is designated by the reference 1, the cartridge case by the reference 2 and the mortar by the reference 3. The projectile 1 is adapted to be projected from the cartridge case by means of a propelling charge 4 in said cartridge case. The detonator 5 of said propelling charge is fired by engagement with a pin 6 located in the bottom of the mortar 3 upon the cartridge being dropped into the mortar.

In the bottom of the cartridge case is provided a small orifice containing a plug 7. The plug 7 blows out when the charge 4 is exploded and some of the gases from the charge 4 are enabled to escape into the bottom of the mortar 3; the pressure of these gases is sufficient to toss the cartridge case 2 gently out of the mortar after the projectile proper has been expelled.

Referring now to Fig. 2, this shows a modified way of ejecting the cartridge case 2 from the mortar 3. In this modification the cartridge case 2, when in

place in the mortar 3, is biased by means of a spring 8 towards the muzzle, and is retained in opposition to such bias by the engagement of a retaining member 9 movably mounted on the mortar 3 with a co-operating retained member 10 fixedly mounted on the cartridge case 2, said retaining member being biased by means of a spring 11 to the non-engaging position and being retained at the engaging position solely by its engagement with the retained member. When the projectile (not shown) is discharged, the reaction of the discharge moves the cartridge case 2 in opposition to said spring 8 so that the retained member 10 is disengaged from the retaining member 9 and the latter accordingly springs to its disengaging position, and therefore when the spring 8 re-asserts itself, the retaining member 9 being now out of the path of the retained member 10, the cartridge case 2 is projected by the spring 8 gently out of the muzzle of the mortar 3.

The spring 8 may take the form of a simple helical spring located in the bottom of the mortar 3 as shown. The retaining member 9 may take the form of an L-shaped lever pivotally mounted at one end to the outside of the mortar 3 so that said lever may be turned to and from an engaging position at which its other end extends a small distance over the muzzle for engagement of a projection 12 thereof with the retained member 10. The retained member 10 may take the form of a simple upward projection from the upper end of the cartridge case 2.

The firing of the projecting charge may be effected either electrically or by percussion cap. In the former case the inner end of the cartridge case 2 has thereon two contacts 13 and 14 connected to the firing circuit which are adapted respectively to engage two contacts 15 and 16 in the bottom of the mortar connected to the supply circuit. The contacts on the cartridge case 2 take the form of a central contact 13 and a surrounding ring contact 14 and the contacts 15 and 16 in the mortar are respectively central and at the same radius as the ring contact 14. These latter contacts 15 and 16 are yieldable for permitting the cartridge case 2 to move, as aforestated, in opposition to the biasing spring 8.

In operation the cartridge is inserted



into the mortar 3 and pressed down in opposition to the spring 8 and the L-shaped lever 9 is turned in opposition to its biasing spring 11 into the engaging position at which it retains said cartridge case. Both arms of the circuit leading to the contacts 15 and 16 in the mortar are then independently completed, this requiring two hands and therefore ensuring that both hands are removed from the L-shaped lever 9. As before described, after the projectile is discharged the cartridge case 2 is gently ejected from the muzzle and all is ready for the immediate insertion of a fresh cartridge.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. A cartridge together with a mortar, howitzer or the like in which it is adapted to be employed, wherein means are provided for automatically ejecting the cartridge case from the muzzle of the mortar or the like after the projectile has been projected.

2. A cartridge and mortar or the like according to claim 1, wherein said cartridge case has a vent in the bottom thereof through which gas from the explosion of the propelling charge is capable of escaping for the purpose of ejecting the cartridge case from the mortar or the like after the projectile has been projected.

3. A cartridge and mortar or the like according to claim 2, wherein said vent is normally closed by means of a plug which blows when the propelling charge is fired.

4. A cartridge and mortar or the like according to any of the preceding claims, wherein the propelling charge is adapted to be detonated, when the projectile is dropped into the mortar or the like, by means of a spike at the bottom of said mortar or the like.

5. A cartridge and mortar or the like according to claim 1, wherein said cartridge case, when in place in the mortar or the like, is biased towards the muzzle and is retained in opposition to such

bias by the engagement of parts on the mortar and the cartridge case respectively, which engagement is released when the cartridge case is moved in opposition to its bias by the discharge of the projectile, thereby permitting the cartridge case to be ejected when the bias re-asserts itself.

6. A cartridge and mortar or the like according to claim 5, wherein the propelling charge is fired electrically.

7. A cartridge and mortar or the like according to claim 6, wherein the cartridge case and mortar have co-operating contacts certain of which yield to permit of the movement of the cartridge case in opposition to its bias.

8. A cartridge and mortar or the like according to claim 6 or 7, wherein the cartridge case and mortar have co-operating contacts certain of which comprise a central contact and a circular contact surrounding it, whereby contact is made whatever the angular position of the cartridge when inserted into the mortar or the like.

9. A cartridge and mortar or the like according to any of claims 5 to 8, wherein the said part on the mortar referred to in claim 5 is a pivoted part spring biased out of engagement with the said part on the cartridge case, and said part on the cartridge case is a fixed projection.

10. A cartridge for use in the combination according to any of the preceding claims.

11. A mortar, howitzer or the like for use in the combination according to any of claims 1 or 5 to 9.

12. A cartridge and/or a mortar, howitzer or the like, substantially as herein described with reference to Fig. 2 of the accompanying drawings.

13. A cartridge substantially as herein described with reference to Fig. 1 of the accompanying drawings.

Dated this 2nd day of December, 1938.

A. A. THORNTON,

Chartered Patent Agent,

7, Essex Street, Strand, London, W.C.2.  
For the Applicant.